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RECENT USSR WORK ON INFECTIOUS DISEASES THAT HAVE NATURAL RESERVOIRS

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A scientific session honoring the 70th birthday of Academician Ye. N. Pavlovskiy and the 45th anniversay of his scientific, pedagogic, and public service was held in Moscow, 29 March-1 April 1954, under the auspices of the Ministry of Health USSR, the Academy of Medical Sciences USSR, and the Institute of Microbiology and Epidemiology, Academy of Medical Sciences USSR. This session reviewed the progress made by Soviet science in the investigation of diseases which have natural reservoirs. This is a field of study that was created by Pavlovskiy, who was the first to formulate a theory of natural reservoirs of human diseases. Seventy reports were presented at the meeting, nine of them at plenary sessions and 61 at sectional meetings dealing with special problems of regional epidemiology and of natural reservoirs of human diseases.

N. N. Zhukov-Verezhnikov, Deputy Minister of Health USSR and Active Member of the Academy of Medical Sciences USSR, opened the meeting by giving an address in which he emphasized the necessity of subjecting to thorough study diseases with natural reservoirs and of introducing into public-health practice effective methods for the control of such diseases. Reports by Ye. N. Pavlovskiy; P. G. Sergiyev, Active Member of the Academy of Medical Sciences USSR; P. A. Petrishcheva, Corresponding Member of the Academy of Medical Sciences USSR; and I. G. Galuzo, Active Member of the Academy of Sciences Kazakh SSR, demonstrated the achievements of Soviet medical science in investigating the sources of transmissive diseases, the ways in which these diseases spread, and the methods for their elimination. The reports presented by these scientists emphasized that collaboration between zoologists, parasitologists, and microbiologists had played a considerable role in the investigation of natural reservoirs of diseases. Many-sided investigations of this type had established that a whole group of blood-sucking arthropods, comprising different species, functions in the transmission of diseases. The results of these investigations made it possible to unravel the very complex epidemiology of the diseases in question.

The authors of reports presented at the meeting paid particular attention to zoonoses of wild and domestic animals. A number of reports dealt with infections the connection of which with natural reservoirs had not been adequately investigated prior to the work reported. A paper by N. G. Olsuf'yev discussed the existence of natural reservoirs of erysipeloid (swine erysipelas) and of listerellosis. In regard to these diseases, it was brought out that the reservoirs of infection in the country are formed by voles, water rats, common shrews, and other animals and in the cities, by grey rats and house mice. There are data which indicate the Ixodidae ticks participate in the transmission of the infection. M. P. Tereshchenko and L. V. Rodkevich confirmed and supplemented in their reports Olsuf'yev's data to the effect that erysipeloid and listerellosis have natural reservoirs.

V. V. Anan'in reported that the occurrence of leptospirosis is connected with the existence of natural reservoirs. Thirteen species of mammals were found to form reservoirs of jaundice-free leptospiroses in foci of this type of disease. The most important transmitters of the infection in this case are the ekonomka voles, water rats, and common voles. The course of epizootic leptospirosis among ekonomka voles was traced during a period of 4 years and the uninterrupted nature of the infection during this period established The existence of natural reservoirs in this case is determined by the nature of the terrain. Papers given by Ye. V. Karaseva, G. A. Krepkogorskaya, A. A. Varfolomeyeva and associates, V. S. Kiktenko, and B. V. Vysotskiy contained date which supplemented Anan'in's report as far as natural reservoirs and the regional epidemiology of leptospiroses are concerned.

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Toxoplasmosis is an insufficiently investigated disease, the occurrence of which is connected with the existence of natural reservoirs. This disease was discussed by D. N. Zasukhin and S. G. Vasina, who summarized the available published information on its clinical aspects, diagnosis, and epidemiology.

Of considerable interest are the new data on natural reservoirs of brucellosis which were presented in reports given by M. M. Rementsova (Kazakhstan), A. M. Gudoshnik (Omsk), and S. I. Kharlampovich (Turkmenia). M. M. Rementsova established that there is spontaneous transmission of the infection with brucellae among ticks of the species Dermacentor marginatus, Ornithodorus lahorensis, Haemophysalis scupense, H. concinna, and H. punctata. By means of experiments in which guinea pigs were used, the fact that there is transmission of the brucellosis infection by ticks, both transovarially and during the course of metamorphosis, was established. The fact that there is spontaneous infection with brucellae of D. marginatus and D. pictus ticks in Omsk Oblast' was reported by A. M. Gudoshnik. S. I. Kharlampovich established that a number of wild animals in Turkmenia, including dzhayrans [Gazella subgutturosa], rodents, and foxes, react positively with respect to brucellosis. In view of the inadequate state of knowledge on the subject of natural reservoirs of burcellosis, further observations in this field are required. These observations must be carried out both under natural and experimental conditions.

The reports dealing with tularemia presented much that is of interest. The papers given by N. G. Olsuf'yev, N. I. Makarov, V. V. Kucheruk, V. P. Borodin, V. G. Petrov, and Ye. I. Selenin, which contained a detailed discussion of tularemia reservoirs of the flood-lands type, attracted considerable attention. The chief components of a reservoir of this type are water rats; blood-sucking, two-winged gadflies; and mosquitoes. The existence of multihost foci of tularemia in flood lands has been proven. It has been further established that these foci coincide with the regions of the highest density of the occurrence of common voles and with regions of the diffuse distribution of the common hamster. The authors who presented this information pointed out that in addition to preventive inoculations, the most effective prophylactic measure is extermination of water rats by using poisoned bait (carrots poisoned with zink phosphide). V. P. Romanova, V. P. Bozhenko, T. I. Tupikova, and S. F. Shevchenko reported on the discovery of new carriers of tularemia transmitters (Mesocricetus raddei and Northern and Sourthern Sicista subtilis infested with Ixodidae ticks and Gamasidae mites). Supplementary data on the characteristics of natural reservoirs of tularemia were given in papers presented by Yu. A. Myasnikov, V. I. Sel'chenko, A. M. Sorina, V. P. Bozhenko, T. I. Pupkova, and S. F. Shevchenko. T. N. Dunayeva described in her report the specific characteristics of the course of tularemia in animals (field mice, common voles, and cats) which determine the epizootological and epidemiological significance of the animals. L. A. Pomanskaya, in her report, discussed the characteristics of tularemia strains isolated at a focus of this disease during a winter epizootic.

N. P. Naumov, in his interesting report, pointed out the epidemiological and epizootological significance of the type of settlement inhabited by rodents. Two basic types of settlements have been determined: contiguous or diffuse settlements and settlements of the mosaic type (band or island type). Contiguous settlements represent a considerable danger from the epidemiological standpoint, once an epizootic outbreak has occurred. However, settlements of this type do not offer favorable conditions for the preservation of the causative factor of the disease. Although settlements of the mosaic type are less dangerous from the epidemiological standpoint, they are of importance, because epizootics readily originate in them. Considerable attention in the work of the meeting was paid to the biology of individual species of rodents which carry infections and to the organization of measures for the extermination of such rodents. Reports by V. V. Kucheruk, I. A. Shilov, P. A. Kartushin, G. A. Sidorov, I. S. Tinker, Ye. N. Aleshin, N. G. Yakovlev, M. V. Shikhanov, G. G. Tsintsinadze, and others discussed problems within this field.

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Many new data on endemic rickettsioses were presented at the meeting. Papers read at the meeting threw new light on the epidemiology and etiology of rickettsioses which had not been formerly known in the USSR. The foci of infectious nephroso-nephritis (a rickettsiosis that is accompanied by an affection of the kidneys) which have been studied by O. S. Korshunova can be subdivided into those of the steppe, foothill, and forest type according to geographic occurrence. The causative factor of the disease in all three types of foci is a species of rickettsiae which Korshunova named in Pavlovskiy's honor Rickettsia pavlovskyi Korschunova 1950.

Many-sided investigations in the three types of foci established that there is spontaneous infection with rickettsiae of wild rodents and of the following ectoparasites: Gamasidae mites, Trombicula mites, Ixodidae ticks, and fleas. It has been proven that there is prolonged preservation of rickettsiae, from generation to generation, in Ixodidae ticks; transphaseal or transovarial transmission of these microorganisms in Gamasidae mites; and transphaseal transmission in Trombicula mites. P. A. Petrishcheva, S. P. Piontkovskaya, D. G. Ayzenshtadt, I. M. Sakhno, and I. M. Grakhovskaya recommended a set of prophylactic measures for preventing the contact of human beings with infected rodents and ticks or mites.

It was established that the ticks Hyalomma asiaticum, which occur in the sand desert in southwestern Turkmenia, are carriers of rickettsiae (S. M. Kulagin, Z. M. Zhmayeva, M. V. Shikhanov, A. A. Pchelkina). The rickettsiae that had been isolated from these ticks proved to be closely similar to those which cause tick spotted fever. They were named Dermocentroxenus deserti pavlovsky by S. M. Kulagin. It has not yet been established whether or not D. deserti pavlovsky are pathogenic to humans. It has been ascertained that rickettsiae are transmitted transovarially by H. asiaticum.

Foci of Q-fever have been found in the Turanian Desert in South Central Asia (P. A. Petrishcheva, Z. M. Zhmayeva, A. A. Pchelkina, B. Ye. Karulin, R. N. Zubkova, N. K. Kamishchenko). It was established that Ixodidae ticks H. asiaticum, Argasidae ticks Ornithodorus tartakovskyi, and Gamasidae mites of the genus Dermanyssidae are rickettsiae carriers infesting sparrows and their nests. It was shown that Ixodidae ticks and Gamasidae mites which infest birds (sparrows) and rodents (Rhombomys optimus and Spermophilopsis leptodactylus) exhibit transphaseal and transovarial transmission of rickettsiae.

The reports by the parasitologists I. M. Grokhovskiy and A. A. Zemskiy dealing with Gamasidae mites and their epidemiological role were heard with great interest. It has been demonstrated at present that a number of species of Gamasidae plays an epidemiological role in foci of various diseases such as rickettsial nephroso-nephritis, vesicular rickettsiosis, Q-fever, and tularemia. A zoological and parasitological investigation carried out by I. M. Grokhovskaya at a focus of rickettsiosis showed that both common voles and red voles [Clethrionomys glareolus] were heavily infested with Gamasidae mites. The rodents were infested with these mites throughout the year. Furthermore, 97% of the nests of common voles contained mites. Many species of Gamasidae mites are capable of attacking human beings and of sucking their blood. O. S. Korshunova and I. M. Grokhovskaya demonstrated that rickettsiae are preserved in the bodies of mites for prolonged periods as a result of transovarial and transphaseal transmission. The presence of rickettsiae in the mites was established by observing under the microscope smears stained according to Romanovskiy.

R. I. Kiselev and G. I. Volchanetskaya reported on the role played by Allodermanyssus sanguineus Hirst mites in the epidemiology of vesicular rickettsiosis (rickettsial pox). They proved in their investigations that A. sanguineus transmit rickettsial pox [to other vectors] and form a persistent reservoir of this infection in nature. They furthermore demonstrated that rickettsiae

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are transmitted transovarially by A. sanguineus. In their work on the mechanism of the transmission of rickettsial pox, Kiselev and Volchanetskaya used the house mouse as an experimental model.

Interesting data were communicated in N. F. Darskaya's paper entitled, "Peculiarities of the Ecology of Xenopsylla gebrilli caspica Fleas of Rhombomys optimus Connected With Characteristic Traits of the Ecology of the Host" and I. L. Kulik's paper entitled, "Specific Characteristics of the Mobility of Rhombomys optimus and Their Influence on the Structure of Natural Foci of Infection." Investigation of the fleas of Rhombomys optimus is of great practical importance under the conditions existing in the desert south of the Aral Sea in connection with the role which this rodent plays in natural foci of a number of diseases that are dangerous to human beings.

A paper by G. I. Netskiy and A. V. Gagarina discussed the geographic distribution of hemorrhagic fever and of the vectors of that disease in Western Siberia. The authors of this paper have discovered new foci of hemorrhagic fever in which the tick Dermacenter marginatus Sulz predominates. On the basis of the data presented by Netskiy and Gagarina, the northern limits of the distribution of foci of hemorrhagic fever coincide with the region of the coexistence of D. pictus ticks and Ixodes persulcatus ticks. In the opinion of these investigators, it would be more accurate to refer to the Omsk hemorrhagic fever as the hemorrhagic fever of Western Siberia.

Reports describing the results achieved by applying measures for the control of vectors of human diseases elicited particular interest. P. G. Sergivey and V. A. Nabokov discussed in their paper work on the control of pests under the conditions existing in the Volga-Akhtubinsk flood lands. They developed methods of individual protection against pests and checked procedures for the extermination of blood-sucking pests. They also tested Ye. N. Pavlovskiy's protective nets, impregnated with a dimethylphthalate gel. The authors of this report described a new method of fighting pests in the open by means of thermal insecticidal smoke cartridges of the NBK [not further identified] type, which emit hexachlorane smoke. A report by G. G. Tsintsadze discussed the application of aerosols as a new method for the extermination of mouse-like rodents and their ectoparasites. N. N. Gorchakovskiy tested the use of DDT and hexachlorane for the control of Ixodidae ticks. Dusts, suspensions, and emulsions of these insecticides were used in the work in question.

Papers on the subjects of helminthology and malaria were also presented at the meeting. The meeting stimulated the interest of the scientific medical community in urgent problems of regional epidemiology and problems connected with the existence of natural reservoirs of human diseases.

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